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KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT

PROCEDURE FOR CONDUCTING THE OXYGEN ACTIVATION (OA) LOG FOR EVALUATING EXTERNAL MECHANICAL INTEGRITY OF A CLASS I DISPOSAL WELL

Procedure #: UICI-3

Narrative:

The purpose of this test is to evaluate the external mechanical integrity of the well. A well has external mechanical integrity if there is no significant fluid movement behind the casing through vertical channels adjacent to the wellbore. One method of checking external mechanical integrity is by conducting the Oxygen Activation (OA) Log following the procedures listed in this document.

A plan for this test shall be submitted to KDHE for review and approval prior to conducting the test. In order to provide KDHE the opportunity to witness the test, the schedule for conducting the test shall be mutually agreed upon. Plan approval shall be obtained from KDHE before commencing the test. The plan shall include a prognosis and schedule for conducting the test. The procedure listed is general in nature. When developing a test plan for an individual well the well configuration, hydrogeology, and operating conditions must be considered. K.A.R. 28-46-33 establishes mechanical integrity requirements. Unlike other approved tests that are subject to interpretational opinion, the OA log provides a more direct method of determining external mechanical integrity.

Modification of this procedure will be considered providing it is demonstrated there is good cause and the objective of this procedure will be achieved.

Procedure:

1. Clear the wellbore of any material that would be corrosive to the logging tools and ensure that there are no obstructions in the well that will prevent passage of the tools.

2. Conduct a baseline Gamma Ray Log and casing collar locator log from the top of the injection zone to the surface prior to taking the stationary readings with the OA tool. This is necessary to evaluate the contribution of naturally occurring background radiation to the total gamma radiation count detected by the OA tool. There are different types of natural radiation emitted from various geologic formations or zones and the natural radiation may change over time.

3. The OA log shall be used only for casing diameters of greater than 1-11/16 inches and less than 13-3/8 inches.

4. All stationary readings should be taken with the well injecting fluid at the normal rate with minimal rate and pressure fluctuations.

5. Prior to taking the stationary readings, the OA tool must be properly calibrated in a "no vertical flow behind the casing" section of the well to ensure accurate, repeatable tool response and for measuring background counts.

6. Take, at a minimum, a 15 minute stationary reading adjacent to the confining interval located immediately above the injection interval. This must be at least 10 feet above the injection interval so that turbulence does not affect the readings.

7. Take, at a minimum, a 15 minute stationary reading at a location approximately midway between the base of the lowest most usable water zone and the confining interval located immediately above the injection interval.

8. Take, at a minimum, a 15 minute stationary reading adjacent to the top of the confining zone.

9. Take, at a minimum, a 15 minute stationary reading at the base of the lowermost usable water zone.

10. If flow is indicated by the OA log at a location, move uphole or downhole as necessary at no more than 50 foot intervals and take stationary readings to determine the area of fluid migration.

11. The results of the OA log and an interpretation of the log by a person with the technical expertise to evaluate the log shall be submitted to KDHE within 30 days of the test completion. Intervals where flow is indicated shall be described and the significance discussed.